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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,901	10/24/2003	Arnold Kholodenko	4118C01/ETCH/ECT	8712

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EXAMINER

PAIK, SANG YEOP

ART UNIT	PAPER NUMBER
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3742

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/692,901	Applicant(s) KHOLODENKO ET AL.	
	Examiner Sang Y Paik	Art Unit 3742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2004.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-20 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumura et al (US 5,151,871) in view of Tamura et al (US 4,549,073) or Orosy et al (US 3,789,190) and Carroll (US 4,795,884).

Matsumura et al discloses a substrate support with a heater electrode disposed in a semiconductor substrate processing chamber and a power source connected to the heater electrode. However, Matsumura does not disclose a meter and a controller to regulate power to the heater electrode by measuring the resistivity of the heater electrode.

Tamura et al or Orosy et al discloses a controller to regulate and determine an electrical resistance of a heating element whose resistance changes with the changes in the temperature of the heating element. Tamura et al or Orosy et al further discloses that the measured resistance of the heating element is compared to a predetermined resistance of the desired temperature to achieve the desired heating temperature. Carroll discloses a voltmeter connected to an electrical resistance element whose resistance changes with the change in the temperature to measure the actual voltage drop across the electrical resistance element.

It would have been obvious to one of ordinary skill in the art to adapt Matsumura et al with a controller shown in Tamura et al or Orosy et al to control the temperature of the heater electrode by regulating its electrical resistance, and in view of Carroll, it would have been

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obvious to one of ordinary skill in the art to adapt Matsumura et al with a meter to better enable the user to inspect the operating condition of the electrical device and further apply such meter to enhance better control of the applying voltage for producing the desired temperature.

With respect to claim 2, 8 and 9, Matsumura et al further discloses that the heating element is made of molybdenum; and since it is well known that the power to generate heat is directly related to the voltage and current (i.e. $\text{power} = \text{voltage} \times \text{current}$), when the temperature of the heater is low, it needs to increase voltage and current to bring the heater to a desired heating temperature and to decrease the voltage and current level when the temperature of the heater is high to bring down the temperature to a desired level.

3. Claims 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumura et al in view of Tamura et al or Orosy et al and Carroll as applied to claims 1-10 above, and further in view of Niori et al (US 5,280,156).

Matsumura et al in view of Tamura et al or Orosy et al and Carroll shows the apparatus claimed except a substrate support with a heater electrode embedded therein.

Niori et al shows a substrate support having a heater electrode embedded therein. In view of Niori et al, it would have been obvious to one of ordinary skill in the art to adapt Matsumura, as modified by Tamura et al or Orosy et al and Carroll, with a substrate support having a heater embedded there in as an alternative support substrate that can also alternatively provide a uniformly heated support substrate to heat a semiconductor substrate such as a wafer.

Response to Arguments

4. Applicant's arguments filed 8/13/04 have been fully considered but they are not persuasive.

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The applicant argues that there is no motivation to combine the prior art references, and the applicant points out that the electrodes of Matsumura which are provided along the outer periphery of the substrate would not have provided an accurate temperature measurement of the electrodes such that using the electrodes to sense the temperature would not be in accordance with the teachings of Matsumura. It is noted that the claimed heater electrode is interpreted as a heating element which provides an electrical resistance heating when supplied with an electrical source. The heater electrode is distinguished from the ordinary meaning of an electrode. An electrode is another term for an electrical terminal which provides an electrical connection to an electrical conductive element. In Matsumura, the heater electrode is the electrical resistive conductive element 14 which is provided with electrodes or terminals that are used to supply the electrical source to power. It is in that sense that the heater electrode is met by the electrical resistive conductive element and not by the electrodes through which the electric power is supplied thereto. Thus, in combination with the Tamura or Orosy, the prima facie of obviousness was made to show the use of the resistance change in an electrical resistance heating element to measure the temperature thereof without a separate temperature sensor.

The applicant's argument that there is no motivation to combine is not deemed persuasive since the applied prior art teaches the advantages of using the heating element as both the heater and the temperature sensor which would have eliminated the added cost of a having a temperature sensor to control the heating element, and it is also noted that the prior art is in the same field of the electrical resistance heating devices field which teaches the pertinent problem with which the applicant was concerned.

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The applicant's affidavit was also considered. But, the applicant's assertion of the unexpected result is not deemed persuasive to overcome the obviousness of the combined applied prior art since the assertion is no more than the ordinary advantage or outcome of using the resistance heating element as both the heater and the sensor which would have obviated the use of an extra sensor along with its wirings that would have created a current leakage as asserted by the applicant. The combined teachings of the prior art would have eliminated the use of an extra temperature sensor and it would have achieved the same result as that of the claimed invention. Thus, the applicant's assertion of the unexpected result is not deemed persuasive.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y Paik whose telephone number is 571-272-4783. The examiner can normally be reached on M-F (9:00-4:00) First Friday Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sang Y Paik
Primary Examiner
Art Unit 3742

syp